

Chapter 4 – Destruction of Pathogenic Organisms

We often do not give a lot of thought to the fact that certain methods of food preparation are actually for the purpose of destroying bacteria and other pathogenic organisms.

COOKING

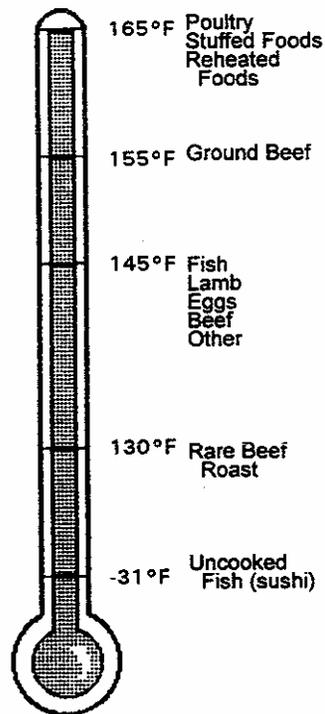
It is generally recognized that food is cooked to increase palatability, to tenderize, to change the character of the food, for cultural reasons or just to make it hot. However, an important reason to cook some foods is to destroy organisms that cause disease. Proper cooking is often the "critical control point" in preventing foodborne disease outbreaks.

Undercooked foods, especially undercooked meats, poultry, eggs, and fish can increase the risk for developing foodborne disease. This is because the dangerous organisms in the raw foods might not have been adequately destroyed.

The following cooking temperatures for specified food will either kill dangerous organisms outright or injure them sufficiently that there is little risk, if the food is eaten promptly after cooking. It should be noted that in order to properly destroy any dangerous organisms, these temperatures should be met for at least 15 seconds.

- Poultry and stuffed foods - 165°F or above.
- Ground meats, ratites, or injected meats - at least 155°F.
- Fish, lamb, eggs, beef (other than ground beef), and unspecified meats - 145°F or above.
- Rare beef roasts - at least 130°F.

DESTRUCTION OF ORGANISMS



Microwave Cooking. When cooking with a micro-wave oven, food must be rotated and/or stirred during cooking to compensate for uneven heat distribution and heated to a temperature of at least 165°F in all parts of the food. Foods cooked in a microwave must also be allowed to stand covered for 2 minutes after cooking.

Food Processing. Cooking as a food processing method must be done to obtain commercial sterility and/or in accordance to specified good manufacturing practices. Smoking of meat must be done during the cooking process or at a temperature of at least 140°F.

Cooking Stuffing. Stuffing placed in an animal's body cavity for cooking must be cooked to at least 165°F. The number of foodborne outbreaks due to undercooked stuffing in poultry necessitates this requirement.

REHEATING

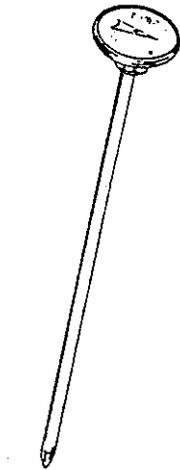
Potentially hazardous foods that have been cooked and then refrigerated and which are to be reheated for hot holding must be reheated so all parts of the food reach **165°F within two hours** (unsliced beef roast - 130°F). Proper reheating is very important in order to destroy the increased number of dangerous organisms in the food since cooking.

NOTE: Steam tables, bain maries, warmers, and similar hot food holding facilities cannot be used for cooking or reheating purposes.

FREEZING

Fishery products which are not thoroughly cooked and are intended for raw, marinated or partially cooked consumption must be **blast frozen to at least -31°F for 15 hours or conventionally frozen to -4°F for 168 hours (7 days)** in order to kill parasitic worms in the flesh.

THERMOMETER



The thermometer is the most important tool for the food industry. Almost every aspect of the food business - from the source to the consumer - has temperature requirements.

Proper cooking temperatures are very important. The thermometer used for checking temperatures must be an approved type. The *Idaho Food Code* requires a metal or plastic stem type thermometer which is numerically scaled and accurate to plus/minus 2°F. Also, the thermometer must be located adjacent to operations requiring frequent temperature monitoring.

To check cooking temperatures, place the thermometer in the center of the food or the portion of the food that has the greatest density. Avoid placing the thermometer next to a bone or fatty area of meats as this will lead to an inaccurate temperature.

It is important to know where the temperature sensing portion of the thermometer is located. It is not correct to assume that all thermometers are the same. If you are not sure, you should check with the manufacturer. For most dial type thermometers, the temperature measuring area is the lower 2 ½ inches of the stem. For most digital thermometers, the temperature measuring area is the lower ½ inch of the stem.

Calibration Procedure for Thermometers. It is important that the thermometer you use for checking food temperatures is properly constructed and **has been recently checked for accuracy** (plus/minus 2°F) (500.12). You can check your thermometer's accuracy by using the ice point/boiling point calibration method.

For ice point calibration, use crushed ice with enough water to make a slush for maintaining the ice point temperature. Stir continuously. Do not let the thermometer stem or sensing element touch the bottom or sides of the container. Allow the thermometer to reach equilibrium, and then read the temperature. The temperature should read 32°F.

For boiling point calibration, make sure the water is a "rolling" boil. Since water boils at different temperatures at different elevations, it is important to know the elevation of your city or community. Once the water is boiling, insert the thermometer into the water (be careful to not burn your hand from the steam). The thermometer should

read a temperature that corresponds with the elevation of your location.

In order to achieve the highest degree of accuracy, both methods should be used to check your thermometers. However, if only one method can be used easily, the ice point method is generally recommended because of the differences in boiling points.

BOILING POINT FOR SPECIFIC IDAHO LOCATIONS

LOCATION	ELEVATION	BOILING POINT
Lewiston	738 ft	211 ° F
Coeur d'Alene	2,187 ft	208 ° F
Caldwell	2,365 ft	208 ° F
Wallace	2,744 ft	207 ° F
Boise	2,842 ft	207 ° F
Twin Falls	3,745 ft	205 ° F
Salmon	4,004 ft	205 ° F
Pocatello	4,460 ft	204 ° F
Idaho Falls	4,730 ft	203 ° F
McCall	5,030 ft	203 ° F
Stanley	6,260 ft	201 ° F
Macks Inn	6,405 ft	200 ° F

Idaho can be approximated from the examples provided. The thermometer should read within one degree of the boiling points for the specific elevation.

IMPORTANT: THERMOMETERS WHICH ARE INACCURATE SHOULD BE PROPERLY ADJUSTED OR REPLACED. Should you have a problem with your thermometer's accuracy, contact your supervisor.

SUMMARY

Ensure the destruction of bacteria and parasites by adherence to the following:

- Cook foods to proper temperature.
- Check food temperatures often with an approved thermometer.
- Fishery products not to be properly cooked need to be adequately frozen before service.
- Check thermometers often for accuracy.

Reference: *Idaho Food Code*, Chapters 3 and 4.